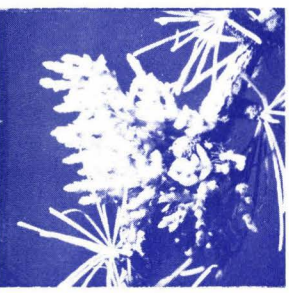
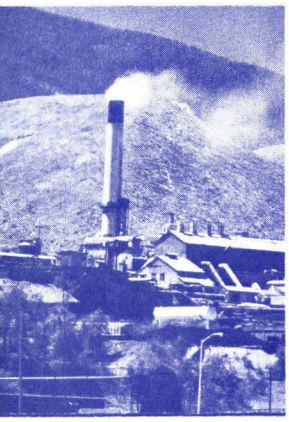
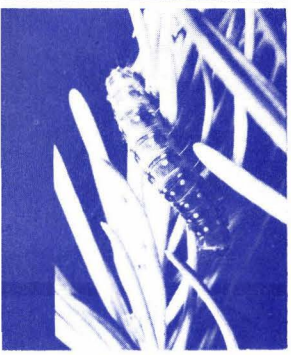
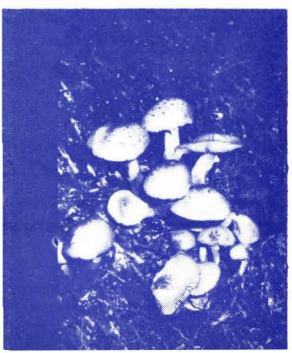
SB761
U7
N6
No. 78-16









FOREST INSECT & DISEASE MANAGEMENT

USDA · FOREST SERVICE · NORTHERN REGION
State & Private Forestry · Missoula, MT 59801

Report No. 78-16

5200
July 1978

EVALUATION OF PROPOSED DWARF MISTLETOE MANAGEMENT PROJECTS ON THE DEERLODGE NATIONAL FOREST

By
Oscar J. Dooling
Plant Pathologist

SUMMARY

Residual lodgepole pine in older clearcuts are dwarf mistletoe-infected and pose a threat to regeneration present. Removal of these residuals coupled with planned or completed precommercial thinnings will effectively reduce dwarf mistletoe to an insignificant level and increase future volume yields. The benefit/cost ratios based on timber values alone are negative for both areas at both 10 and 6 percent discount rates, but other benefits outweigh the economic ones. Dwarf mistletoe management is recommended.

INTRODUCTION

The Deerlodge National Forest has proposed the removal of dwarf mistletoe-infected lodgepole pine overstory from 40 acres on the Jefferson Ranger District and from 61 acres on the Butte Ranger District to protect regeneration from infection. I evaluated these areas on May 31, 1978.

National FS Library
USDA Forest Service

JUN 28 2011

240 W Prospect Rd
Fort Collins CO 80526

TECHNICAL INFORMATION

Causal agent. Lodgepole pine dwarf mistletoe, Arceuthobium americanum Nutt. ex Engelm.

Host. Lodgepole pine, Pinus contorta Dougl.

Type of damage. Reduction of tree vigor, height and diameter growth, and some mortality.

DESCRIPTION OF AREAS AND PROPOSED TREATMENT

Locations of the proposed areas are shown in figures 1 and 2. Proposed treatment is to remove residual dwarf mistletoe-infected lodgepole pine overstory trees from cut-over stands with advanced reproduction.

FIDM targets for the project are shown in figures 3 and 4.

DISCUSSION

Dwarf mistletoe is responsible for the most serious disease losses in the lodgepole pine forests of central Montana. Growth losses of 50 percent or more are common. Dwarf mistletoe not only causes growth loss and direct mortality, but also predisposes trees and entire stands to attack by other disease organisms and insects.

Removal of infected overstory trees removes the dwarf mistletoe seed source, and the young stand remains essentially free of infection throughout the rotation.

BENEFIT/COST ANALYSIS

Both Ranger Districts. Based on previous yield simulation computer runs for comparable areas, one precommercial and one commercial thinning should produce these volumes:

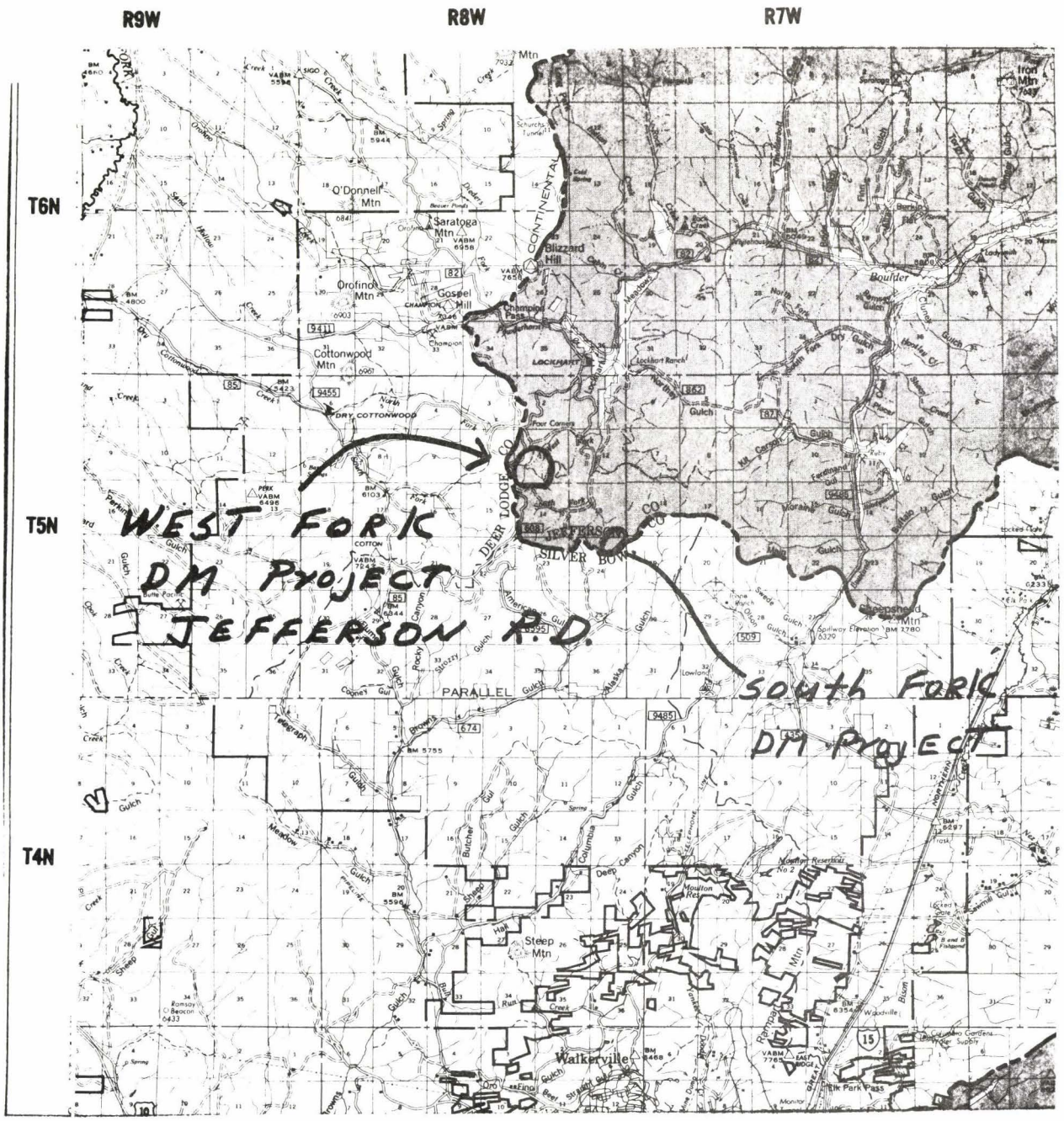


FIGURE I. Dwarf mistletoe control areas, Jefferson Ranger District

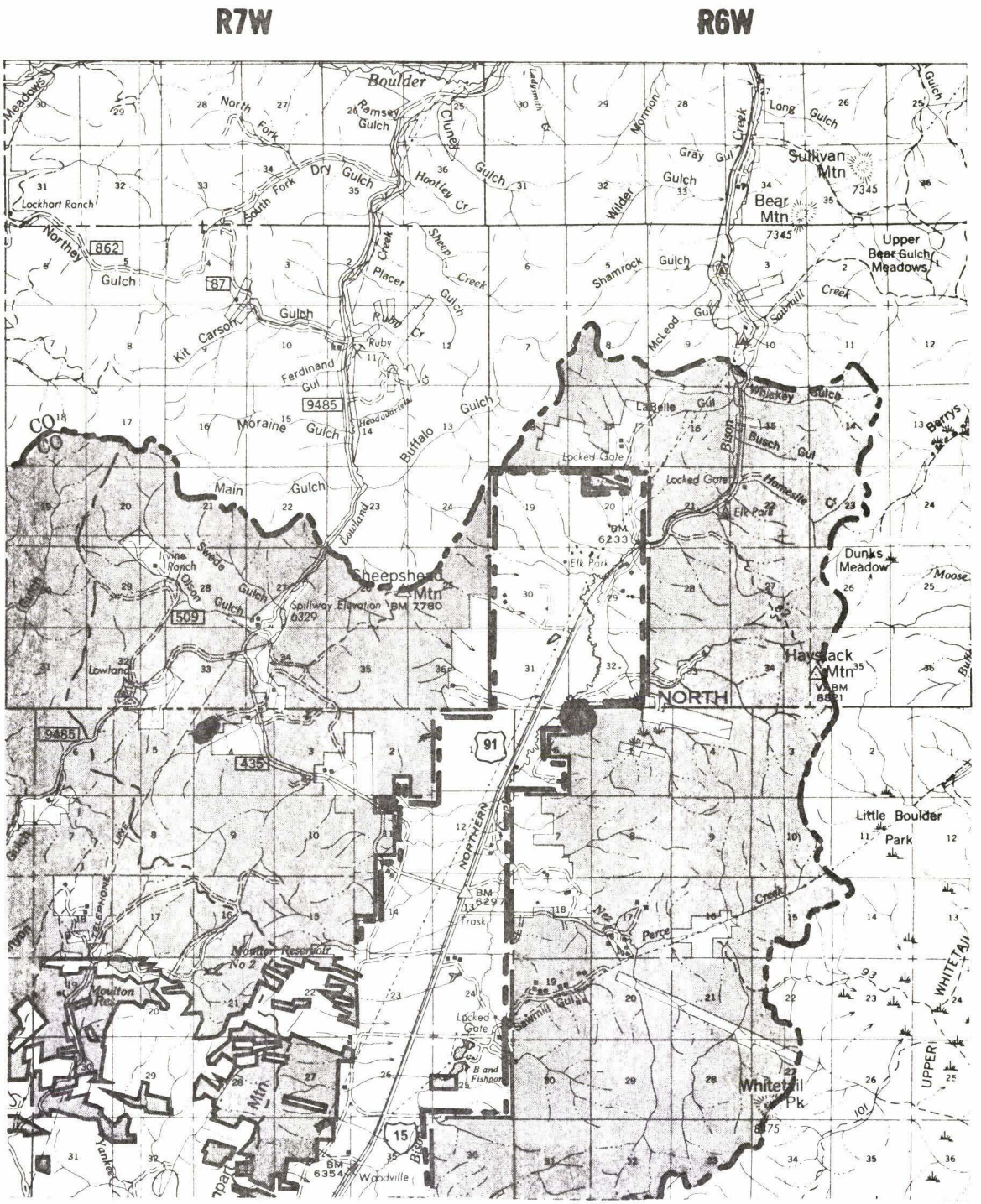


Figure 2. Dwarf mistletoe control areas, Butte Ranger District

FIDM TARGETS

FOR THE Jefferson Dwarf mistletoe SUPPRESSION PROJECT
(Name of Project)

	Acres (in M)	Vol. Protected (in MCF)	Vol. Removed (in MCF)
I&D Presuppression-Operational Survey		XXXXXXXXXXXXXX	XXXXXXXXXXX
I&D Prevention/Suppression Using Biological Methods			
I&D Prevention/Suppression Using Chemical Methods			
I&D Prevention/Suppression Using Silviculture/Mechanical Methods. . .	0.04	131	4
Total	0.04	131	4

FIGURE 3. FIDM targets for the Jefferson dwarf mistletoe control area.

FIDM TARGETS

FOR THE Butte Ranger District SUPPRESSION PROJECT
(Name of Project)

	Acres (in M)	Vol. Protected (in MCF)	Vol. Removed (in MCF)
I&D Presuppression-Operational Survey		XXXXXXXXXXXXXX	XXXXXXXXXXXX
I&D Prevention/Suppression Using Biological Methods			
I&D Prevention/Suppression Using Chemical Methods			
I&D Prevention/Suppression Using Silviculture/Mechanical Methods. . .	0.06	196	6
Total	0.06	196	6

FIGURE 4. FIDM targets for the Butte dwarf mistletoe control area.

Cutting age	Volume recovery (MBF)	Value per MBF a/	Total recovery value ($)
15	-	-	-
70	2.0	65	130
100	16.0	65	1,040
Totals	18.0		1,170

a/ Current net stumpage on the Deerlodge National Forest.

By applying a 10 percent discount rate to these values, the present net worth (pnw) of dwarf mistletoe control is:

Time (n)	Dollar value	Discount factor a/	pnw ($)
50	130	0.0085	1.11
80	1,040	0.0005	.52
Totals	1,170		1.63

a/ Present value of $1.00 for n years @ 10%.

By applying a 6 percent discount rate to these values, the pnw of dwarf mistletoe control is:

Time (n)	Dollar value	Discount factor a/	pnw ($)
50	130	0.0543	7.06
80	1,040	0.0095	9.88
Totals	1,170		16.94

a/ Present value of $1.00 for n years @ 6%.

Jefferson Ranger District. Cost of treatment will be $82.50 per acre. By dividing the pnw of the benefits by the treatment cost, the benefit/cost ratio is 0.02/1 @ 10 percent and 0.20/1 @ 6 percent.

Butte Ranger District. Cost of treatment will be $75.80 per acre. The benefit/cost ratio is 0.02/1 @ 10 percent and 0.22/1 @ 6 percent.

Discussion of Benefit/Cost Analysis. These calculations assume that the value of stumpage will remain at present levels for 50 and 80 years. This is probably false; stumpage prices will continue to rise, the benefits will be greater, and the benefit/cost ratio will improve.

There will also be value added to the economy. Each million board feet of timber cut creates 7 person-years of employment paying an average of $13,400 per year. This will generate 0.02 and 0.16 years of employment in 50 and 80 years respectively and add $2,412 per acre to the economy.

Another benefit not directly related to pnw in dollars is the reduction in dwarf mistletoe infection at each stand entry. By the end of the first rotation, each area should be essentially dwarf mistletoe-free and should remain so for many rotations.

RECOMMENDATIONS

Decision for Control. Dwarf mistletoe management is biologically sound and should be done.

Control Method. Removal of dwarf mistletoe-infected overstory trees from cut-over stands with advanced regeneration is the method selected for management.

Impact of Control on Other Resources. Because management of dwarf mistletoe will be by removal of residuals from areas already clearcut, there will be no additional adverse impact on other resources. Environmental Analysis Reports for the areas are on file at the Jefferson Ranger District Office in Whitehall, Montana, and the Butte Ranger District Office in Butte, Montana